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## Impact of financial crises on oral health indicators: an integrative review of the literature

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**Abstract** *The aim of this study was to analyze, by an integrative review of the literature, the possible impacts of financial crises on oral health indicators in different countries, as well as to verify the measures adopted in order to compare with the Brazilian reality. A search for articles that met these criteria was carried out in PUBMED, EMBASE, Lilacs, SCOPUS and also in the gray literature. At the end, nine studies were included. The results indicate that the population with higher vulnerability, lower income and lower educational level are the most affected, independently of the evaluated indicator (untreated dental caries, access to dental care services and hygiene habits). When protective measures with allocation of financial resources were taken, disparities decreased. It was concluded that, faced with economic crises, oral health is no longer a priority, which impacts access to care for the less favored social strata.*

**Key words** Oral Health, Health Management, Health Status Indicators.

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## Introduction

Brazil is experiencing a complex scenario, from both an economic and political point of view, with direct effects on the health sector. The consequences of the world's economic crisis that hit several countries in 2008 have been perceived in Brazil since 2011, with an increase in the unemployment rate and a decrease in demand by industries. This situation was aggravated by the political crisis, in which Legislative and Executive disputes, somehow modulated by the Judiciary, led to institutional destabilization and the consequent impeachment of President Dilma Rousseff in 2016, aggravating the scenario of political instability in the country.

Contexts such as these, which involve economic recession and political crisis, cause the destabilization of institutions and decrease in funds for crucial areas, such as health<sup>1,2</sup>. These fiscal adjustments, preferably achieved by cutting costs, are adopted with the justification of adjusting the economy and promoting the country's growth<sup>3</sup>. The greatest example of this situation in Brazil was the approval of Constitutional Amendment N. 95, in December 2016, which deals with the New Fiscal Regime (NFR)<sup>4</sup>. Starting on December 16, 2016, when it was approved, a number of provisions were introduced into the Transitional Constitutional Provisions Act that programmed a new fiscal regime with a cap on federal government spending, a cap that spared neither the Health nor the Education sectors and will be in effect for the next twenty (20) years.

One can observe, at the international level, that the adoption of fiscal austerity policies that affect the health sector is not new in the current capitalist world. In response to the 2008 financial crisis, for instance, countries with Universal Health Systems such as England, Germany, and Spain have adopted austerity policies that limit public health spending, aiming at controlling the public deficit<sup>1,5-7</sup>. However, in the case of the Brazilian austerity policy, spending will be stagnant in actual terms and for a fixed period of two decades, being more radical than the measures adopted by the other countries.

If economic crises are enough to worsen people's health, by increasing poverty and changing other social determinants of health, the austerity policies reinforce this process by reducing social protection and decreasing the allocation of resources to the health system<sup>3</sup>. In this context, recent studies have already indicated the worsening of Brazilian basic health indicators after the new

fiscal regime was introduced, suggesting that the reduction in health investments is already affecting health promotion, prevention and attention policies<sup>2,8</sup>. In the specific case of oral health, an even more damaging scenario can be foreseen, given that limitations in the provision and access to oral health services make untreated dental caries, even currently, the most common morbidity among all diseases worldwide, a fact that makes it a considerable economic burden for the individual and society<sup>9-12</sup>. However, even considering the world scenario, Brazil is currently the only country in the world to include oral health care and assistance in its public health system (Brazilian Unified Health System - SUS)<sup>13</sup> for more than 200 million inhabitants, with a public, universal system that includes different levels of care.

Recent changes in the guidelines of the main public policies, including oral health policy, may severely compromise the progress made by the country. The continuity of the National Oral Health Policy (*Política Nacional de Saúde Bucal*, PNSB) or the "Smiling Brazil" program depends on political will and popular movement, as traditionally in Brazil, government programs are not synonymous with State programs<sup>14,15</sup>. Considering that the allocation of resources for oral health has been historically neglected before the existence of the "Smiling Brazil" program, one can presuppose a challenging scenario.

Other countries have experienced major economic crises and the results experienced by the health sector actions, whether successful or unsuccessful, can be used as basis for the planning of national measures, if one looks at the specific features. Given the above-mentioned facts, the aim of this study was to assess, based on an integrative literature review, the impact of financial crises on oral health indicators. In view of the findings, it was observed how the countries proposed coping with this scenario and a critical-reflective discussion was intended, considering the current Brazilian scenario.

## Methods

### Study Design and Question

The integrative literature review was carried out and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement<sup>16</sup> and the study question was: "What is the impact of financial crises and austerity policies on oral health indicators?"

### Search Terms and Strategy

Based on the question, a search was carried out using specific terms extracted from Mesh and Emtree to allow the adequate strategy. A systematic search was carried out in July 2019 on electronic databases including PubMed, EMBASE, Scopus and Lilacs to identify studies that analyzed the association between financial crises and austerity policies with oral health indicators. There was no language or date restriction and the combination of terms with their synonyms, as well as the results found for each electronic database on the day of the search is shown in details in Chart 1.

A search was also carried out in the gray literature and contact was made with researchers from the area to retrieve unpublished studies (Chart 2).

Finally, the references of relevant articles included for full-text reading were also checked to assess the inclusion of additional studies.

### Eligibility criteria

Only primary studies that specifically associated the impacts of an economic crisis and/or austerity policy on oral health indicators were included. Review studies, letters, editorials and opinion articles were excluded.

### Study selection

The database search resulted in 180 articles. Additional searches were made on Google Scholar, including analysis of the first 10 pages (100 articles). The 262 references were then exported to Rayyan QCRI<sup>17</sup>, a tool used to remove duplicates and to screen titles and abstracts according to the eligibility criteria. At the end of the entire selection process, 9 studies were included, as shown in Figure 1.

**Chart 1.** Search strategies and results in indexed databases.

Date of search	Database	Strategy details	Results
July 15, 2019	PUBMED	((Economic Recession OR Economic Recessions Recessions, Economic Recession, Economic OR Economic Depression OR Depression, Economic OR Depressions, Economic OR Economic Depressions OR austerity policy)) AND (Oral Health OR Health, Oral OR Stomatognathic Diseases OR Disease, Stomatognathic OR Diseases, Stomatognathic OR Stomatognathic Disease OR Mouth and Tooth Diseases OR Dental Diseases OR Dental Disease OR Disease, Dental OR Diseases, Dental)	141
July 15, 2019	EMBASE	'economic recession'/exp AND ('mouth disease'/exp OR 'dental health'/exp)	09
July 15, 2019	Lilacs	(tw:(Economic Recession OR Economic Recessions Recessions, Economic Recession, Economic OR Economic Depression OR Depression, Economic OR Depressions, Economic OR Economic Depressions OR austerity policy)) AND (tw:(Oral Health))	14
July 15, 2019	SCOPUS	(TITLE-ABS-KEY("Economic Recession" OR "Economic Recessions" OR "Economic Depression" OR "austerity policy") AND TITLE-ABS-KEY("Oral Health" OR "Stomatognathic Diseases" OR "Mouth and Tooth Diseases" OR "Dental Disease"))	16
Total			180

**Chart 2.** Search strategies and results in unofficial databases and gray literature.

Date of search	Database	Strategy details	Results
July 15, 2019	Google Scholar	Economic Recession and Oral Health	100 (10 first pages)
Total			100

### Data extraction

A previously created Excel spreadsheet was used to extract the following data: (author/year, assessed economic crisis, assessed impact on oral health, authors' conclusions).

### Results

Chart 3 shows the characterization of the nine included studies, containing information on the study design and purpose, economic crisis, country and oral health indicator evaluated. The recent economic crisis that affected the United States was the most evaluated one (04 studies). Other assessed countries were Iceland (01 study), Finland (01 study), Greece (01 study) and Spain (01 article). One study aimed to assess the effect of the economic crisis on 23 European countries. No studies were found evaluating the Brazilian context.

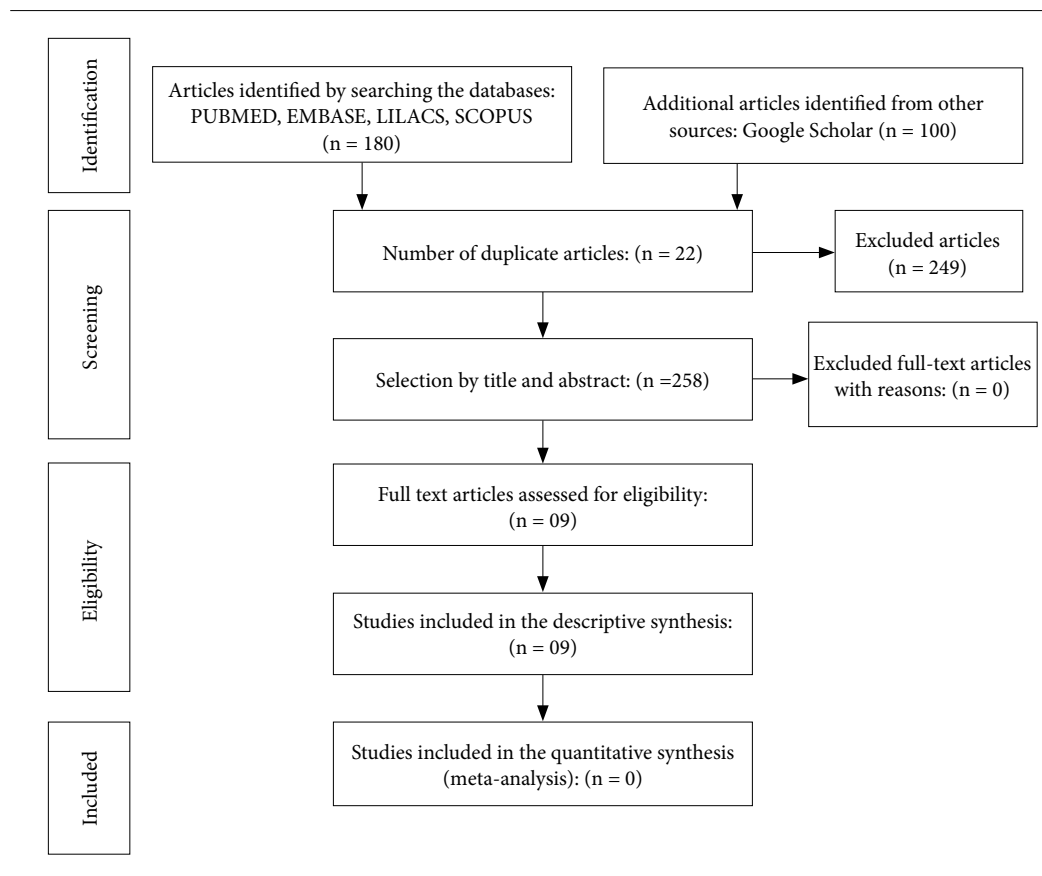
The main assessed indicators were access to oral health services and untreated caries. Only one study evaluated the incidence of maxillofacial fractures as an indicator.

Chart 4 shows the results and conclusions found by the authors of the 9 included studies.

In the overall context of the several countries, it can be said that the effects of crises affect the most vulnerable and low-income population with the least schooling. It can also be observed that when protective measures are taken, including increased financing, oral health inequities decrease.

### Discussion

The association between economic conditions and health outcomes is a complex one and may involve multiple and interrelated pathways. There are scarce studies that assess the impact of



**Figure 1.** Flowchart of the selection of included studies.

**Chart 3.** Characterization of studies included in the review according to the eligibility criteria.

Author, year	Study design	Objective	Economic crisis considered	Country	Assessed Indicator
Suominen-Taipale and Widström, 1998 <sup>18</sup>	Observational	To determine whether the economic recession in Finland during the early 1990s affected the use of dental services.	1991-1994	Finland	Use of oral health services
Wall et al, 2012 <sup>19</sup>	Observational	To assess the trends in oral health service use from 1997 to 2010, covering a period before, during and after the recent economic recession.	December 2007 to June 2009	USA	Use of oral health services
Abasaheed et al, 2013 <sup>20</sup>	Observational	To determine whether the economic recession had an impact on the number of untreated caries in baby teeth.	2007-2009 crisis	USA	Untreated caries
McClure and Sæmundsson, 2014 <sup>21</sup>	Observational	To verify changes in oral health behaviors and frequency of dental visits before and after the onset of Iceland's economic collapse of 2008	2008	Iceland	Frequency of dental visits and daily brushing and flossing habits
Rallis et al, 2015 <sup>22</sup>	Observational	To investigate the impact of the financial crisis on the etiology of maxillofacial trauma in Greece and to discuss the social parameters that may influence the injury change patterns.	2008 financial crisis and austerity measures adopted in 2010	Greece	Maxillofacial fractures
Beazoglou et al, 2015 <sup>23</sup>	Observational	To assess the impact of Medicaid rate increases and the economic recession in relation to changes in Medicaid's enrollment numbers, utilization rates and service mix.	2007-2009 crisis	USA	Use of oral health services (Medicaid)
Fernández et al, 2015 <sup>24</sup>	Observational	To estimate the effects of the crisis on unmet dental care needs in Spain and to analyze the evolution of socioeconomic inequalities on these unmet needs before (2007) and during (2011) the current crisis.	2011	Spain	Untreated caries
Elstad, 2017 <sup>25</sup>	Observational	To analyze income inequalities in self-perceived access to dental care during the crisis years in 23 European countries.	2008-2013	23 European countries	Dental care coverage (%)
Guay, 2019 <sup>26</sup>	Observational	To quantify how the Great Recession impacted the demand for overall oral health care and, specifically, orthodontic care.	December 2007 to June 2009, a period known as the Great Recession	EUA	1. Frequency of visits to the dentist (general practitioner) 2. Frequencies of visits to the dental surgeon (orthodontist)

**Chart 4.** Results and conclusions of studies on the impact of economic crises on oral health indicators, sorted by year of publication.

Author, year	Main results	Conclusions
Suominen-Taipale e Widström, 1998 <sup>18</sup>	The only significant alteration during the years of the study on the use of dental services was observed among the groups entitled to subsidized care, which were those who reduced consultations and demand for dental care.	The intensified competition caused by the increase in the number of dental surgeons probably partially counterbalanced the effects of the economic recession; however, this market dispute between professionals favored individuals with higher income and levels of schooling.
Wall et al, 2012 <sup>19</sup>	Among the children, there was a steady increase in the use of dental services between 1997 and 2010, coinciding with a shift from private to public insurance.	A desaceleração econômica entre 2007 e 2009 não resultou em um declínio estatisticamente significativo na taxa de utilização de atendimento odontológico entre a população como um todo. Mas a tendência agregada mascara uma variação significativa por idade e nível de pobreza.
Abasaeed et al, 2013 <sup>20</sup>	On the other hand, the adult population showed a reduction in access to dental services, particularly when assessing the lower income ranges. This is due to the fact that adult dental services are not a mandatory benefit under Medicaid.	The economic deceleration between 2007 and 2009 did not result in a statistically significant decline in the rate of dental care use among the population as a whole. But the aggregate trend masks a significant variation by age and poverty level.
McClure e Sæmundsson, 2014 <sup>21</sup>	It was observed that a smaller number of children are receiving necessary dental care because of the 2007-2009 economic crisis, which led to a reduction in recent gains in the treatment of dental caries in children from North Carolina.	The deleterious effects of the Great Recession on the oral health of North Carolina kindergarten students were small but statistically significant.
Rallis et al, 2015 <sup>22</sup>	Overall, there was no general change in oral health behaviors (e.g., annual visits to the dentist and adequate brushing / flossing habits).	Economically vulnerable students are less likely to seek dental care during an economic crisis, while specific groups (unemployed men and women) increase healthier behaviors.
Beazoglou et al, 2015 <sup>23</sup>	The rate of facial fractures caused by car accidents before the crisis worsened was significantly reduced in the post-2010 period. In turn, the incidence of fractures due to interpersonal violence increased during the period of severe economic crisis.	The authors attribute the decrease in the rate of facial fractures caused by motor vehicle accidents to high gasoline prices, which led to a significant reduction in individual transport use. On the other hand, they attribute the increased incidence of fractures due to interpersonal violence to the increase in poverty and unemployment, which generated a wave of violence in the country.
Fernández et al, 2015 <sup>24</sup>	The combination of increased Medicaid reimbursement rates for enrolled dentists, better program management, and the economic recession led to an unprecedented increase in utilization rates of program-related oral health services. Specifically, service utilization rates increased, while the United States experienced the worst economic recession since the Great Depression of 1929.	Although it was impossible to quantify the separate effects of rising recession rates, there is considerable indirect evidence that the recession contributed to higher utilization rates.

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**Chart 4.** Results and conclusions of studies on the impact of economic crises on oral health indicators, sorted by year of publication.

Author, year	Main results	Conclusions
Elstad, 2017 <sup>25</sup>	There was an increase in the need for oral health care. The Spanish health system provides basic coverage for preventive and restorative dental care with public funding for children. However, unlike other health services, publicly funded dental care for adults is limited to acute care.	The economic crisis resulted in an increase in the number of unemployed individuals and a decrease in the available income, both determinant factors of unmet dental care needs by the adult population.
Guay, 2019 <sup>26</sup>	<p>There was a loss of 3.1% in dental care coverage considering the gross national average. The results show that countries with higher basic dental care coverage – whether from public health, compulsory social insurance or both – tend to have better access to dental treatment for the low-income strata, as well as lower income-related inequalities in dental care. The demand for oral health services declined during the recession for both general practitioners (GP) and orthodontic services. In 2015, the low-income group ended up slightly below the 2003 level, whereas the higher income group experienced a steady increase in the number of dental appointments (GP) during the study period, ending at a higher level in 2015 in comparison to 2003.</p> <p>For orthodontic consultations, in turn, the highest income group showed a decline in the first half of the study period and recovered it during the second half. The low-income group experienced a slight increase in dental visits, ending at a higher rate of visits in 2015 when compared to 2003. For both services, direct spending decreased slightly (4.8% for general oral health care and 0.04% for orthodontics).</p> <p>This difference can be explained by the often characteristic contractual payments for orthodontic care, which may moderate the effects of changes in short-term demand. The significant increase in payments made by government assistance programs is evident for both types of services, indicating that these programs either isolate overall economic trends or increase in response to a general economic deceleration.</p>	<p>The results indicate that the lowest income stratum (i.e., the fourth lowest in the country's income hierarchy) reported that the previous dental assistance was significantly more frequent than the upper income stratum in all 23 assessed countries, both in 2008/2009 and 2012/2013.</p> <p>The deceleration in the status of the overall economy during the Great Recession period resulted in a decrease in the demand for general oral health care and orthodontic care in the United States.</p>



economic crises on the oral health indicators of the population. However, in general, some predictions can be made for Brazil if the results are evaluated considering the particularities of our country and our policy.

The oldest study we found assessed the impact of the 1990s economic recession on the use of oral health services in Finland<sup>18</sup>. It was hypothesized that the crisis would have reduced the demand for oral health services, but such an outcome was not confirmed in the overall context, as only the group of patients subsidized by the government showed a significant reduction in the demand for oral services during the study years. The increase in the number of dental surgeons in the country increased the competition among them, reducing the costs of treatment and partially counterbalancing the effects of the economic crisis. However, it is noteworthy that this competition favored particularly the social strata with high income and high level of schooling.

At this point, we draw a parallel with the Brazilian reality. The number of dentists in the country was already considered high in 2004, the year the “Smiling Brazil” program was launched. However, this did not result in better access to oral health care for the population, a fact that is evident when we observe that, at that time, 28 million Brazilians had never been to the dentist<sup>27</sup>. Until then, the Brazilian public dental assistance was focused on the curative maternal-child model, with severe problems of distribution of human resources in a country of continental dimensions, which, without planning, became mutilating and elitist<sup>28</sup>.

With the implementation of “Smiling Brazil” program, the Brazilian population had this demand met through the offer and expansion of public oral health services. Even though the issue of the distribution of professionals has not yet reached optimal levels, public oral health policies started to encourage professionals to go to countryside and regions with greater vulnerability, aiming at a more equitable provision of dental services<sup>15,29</sup>. The positive impact of these measures can be perceived also by the improvement achieved in the Brazilian epidemiological scenario, according to results from SB Brasil 2010<sup>30</sup> and SB São Paulo 2015<sup>31</sup>, at national and local levels, respectively.

Moreover, it should be noted that in Brazil, it is estimated that at least 80% of the population depends exclusively on public dental care<sup>15,32</sup>, which, compared to the subsidized Finnish population, would be the most severely affected, in-

creasing oral health disparities. Considering that the Finnish government postponed plans to extend health insurance to cover dental services for the entire adult population due to economic constraints<sup>18</sup>, one can assume that oral health is often outside the list of governments’ priorities, when it comes to ensure the access of their populations to health care.

Thus, the importance of the “Smiling Brazil” program is emphasized, concerning the expansion of dental services in the Brazilian public service. The continuity of public policies that combine the provision of health services based on principles of equity and quality of care are determinant for the advance, in future results, in terms of access and use, problem-solving and improvement of oral health conditions of the population<sup>15</sup>. However, recent political and economic crises at global and national levels indicate several changes in this scenario, a situation that may negatively affect the oral health of the population.

Economic crises have some consequences, and among them, an increase in unemployment rates and an effect on the decrease of the Gross Domestic Product (GDP), which results in a substantial loss of wealth. In the US case, citing Medicaid, such situation caused dentists in some states to experience a sharp reduction in demand for care during the 2007-2009 crisis. With the unused capacity and increased reimbursement offered by Medicaid, there was a growing interest by these professionals for the program. This has allowed the Medicaid-assisted population to have more access to dental services, which significantly increased the use of dental services. One of the highlighted points was that the professionals were attracted to the program because there was an update in the reimbursement values offered by the government<sup>23</sup>.

Medicaid is a social resource program aimed only at the low-income North-American population. With the crisis and high unemployment rates, more people started being assisted by the program. And it was precisely the financial investment amidst the crisis (through increases in reimbursements to professionals) that allowed access to dental care services to increase<sup>23</sup>. This situation is highly relevant to the Brazilian context, even though there is a big difference between the policies of the two countries.

Also in this context, when analyzing access to services without restricting Medicaid evaluation, it was observed that when the result is evaluated in aggregate form, despite the occurrence of a decline, there is no statistically significant differ-

ence regarding the rate of dental care service use among the population as a whole. However, there is a significant variation by age and poverty level. Differently from the pediatric population, adults (even low-income ones) are not necessarily assisted by Medicaid. And it was precisely among this population that the impact of the crisis was most significant<sup>19</sup>.

This investment situation is exactly the opposite of what has happened in Brazil, because with the economic crisis, the number of SUS-dependent patients tends to increase. However, the investment and continuity of the “Smiling Brazil” program has been severely hindered, mainly due to the precariousness of the service and, to some extent, in a perverse manner, by denying it to the population that needs it the most. The deactivation of Dental Specialty Centers (nationwide), the increasing termination of Family Health Teams’ accreditation (especially in Rio de Janeiro) and the implementation of the current National Primary Care Policy<sup>33,34</sup> support this throwback movement in relation to social policies, which is also observed in other fields of SUS, and not only regarding oral health. In contrast, the literature indicates that, at the macro level, health policies should build an agenda to fight inequities, aiming to reduce the exposure of vulnerable individuals to health-harming factors, while minimizing the impact of the (social, economic) consequences of oral diseases. This can be achieved by promoting oral health care in an accessible, appropriate and effective way, directed to the population groups on the margins of society, most susceptible to oral diseases<sup>35</sup>.

Faced with the economic crisis, the indicator “untreated dental caries” was evaluated in the United States<sup>20</sup> and Spain<sup>24</sup>, respectively. Both studies showed an increased need for dental treatment in the assessed population. In this context, in Spain, publicly-funded dental care for adults was limited to acute cases (urgent care) and acute pathologies. This population was the most affected regarding oral health, indicating the need to rethink the offer of public dental services in the local area<sup>24</sup>. This type of consequence of the financial crisis places oral health at a non-priority level in health systems, so that care actions are restricted to damage limitation, typical of the surgical-restorative dental paradigm, which has been so strongly opposed in the last decades, and that, possibly, will gain support again, even in Brazil, with the support of the austerity policies and containment of expenditures signaled by the federal government.

Regarding the oral health habits after the crisis that affected Iceland, it was observed that there were no major differences in the population, although specific groups deserve special attention in times of crisis, such as the economically vulnerable groups<sup>21</sup>. From this perspective, one must consider that oral diseases disproportionately affect disadvantaged social segments, evidencing, from an epidemiological point of view, the influence of social gradients on oral health<sup>36</sup>. This fact indicates the importance of actions aimed at oral health promotion and protection, encouraging the development of healthy habits and strongly associated to the increased oral health resolutivity in Primary Health Care<sup>37</sup>.

Faced with the crisis in Greece, the indicator “incidence of maxillofacial fractures” was analyzed, with an increase in fractures caused by interpersonal violence<sup>22</sup>. This finding needs to be analyzed concerning two aspects. First, considering the issue of violence, and bearing in mind that Brazil is known to be a country marked by violence (in traffic, interpersonal) and, finally, because this situation has an impact on health services. The result found by Rallis et al.<sup>22</sup> is also expected for Brazil. But, moreover, it is necessary to emphasize that maxillofacial fractures, in general, demand more complex care, very often requiring extensive surgery in hospital settings. Thus, the increase in its incidence has a greater impact on costs for the public health system, as they require continued investments in addition to oral health actions in primary care, implying oral health actions at secondary and tertiary levels, which are necessarily onerous to public finances.

Moreover, the greater coverage of dental care is significantly associated with lower income inequality in this access<sup>25</sup>, a fact that reinforces the importance of public policies aimed at guaranteeing access to good-quality dental care, such as the “Smiling Brazil” program, and its strengthening is required from the point of view of management and the defense of financial investments to ensure the fight against inequalities in oral health in Brazil. Therefore, we consider that the decrease in the allocation of resources or the lack of investments that guarantee the offer of oral health services may compromise the access of the most vulnerable patients and, thus, aggravate the discrepancies in oral health. This finding becomes critical when contextualized in a country of continental dimensions such as Brazil, marked by blatant regional differences that affect all sectors of society (mainly education and health),

and which, if not handled in an inclusive manner, tend to be aggravated.

Hence, it seems important to highlight that the economic and political crisis that has been affecting Brazil since 2014, with a falling GDP, rising unemployment rates and falling *per capita* income, combined with an austerity scenario with budgetary limitations with the publication of the Constitutional Amendment N. 95, an increase in the Untying of Union Revenues (DRU, from *desvinculação de receitas da União* in Portuguese) from 20 to 30% and tax exemptions have had consequences on health indicators in Brazil, regarding this study, those related to oral health. This is particularly important if one considers that budgetary constraints brings with them difficulties in costing and the maintenance

of sufficient human resources to meet local demands, leading to lack of assistance. Thus, taking into account the basic principles of economics, economic austerity itself is a demand feedback process, with has a profound impact on health indicators.

It was concluded that, faced with the economic crises, oral health is no longer a priority as a nucleating center of policies, which impacts on the access to care for the less favored social strata. In this regard, oral health conditions that, even nowadays, are considered a public health problem and, therefore, frequent, preventable and of known control, may re-emerge among the most vulnerable individuals, while situations of greater complexity might require greater investments, considering the specifics of the local reality.

## Collaborations

LF Probst and AD De Carli participated in the initial project design, data collection, manuscript writing and final approval of the version to be published. AC Pereira and GA Pucca Junior participated in the critical review of the content and final approval of the version to be published.

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